

I-65 to US 31W Connector

Item No. 03-016.00

**Identification of Anticipated Land Use Changes
for Indirect and Cumulative Effects Analysis**

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I. Purpose of this Report

Cumulative effects analysis seeks to identify the impact on the environment which results from the direct and indirect impacts of a particular action or project when added to past, present, and reasonably foreseeable future actions of others. The particular action studied in this report is the I-65 to US 31W Connector project located in Warren County, Kentucky. The analysis identifies the anticipated land use changes of the project alternatives in the project study area. These land use changes will form the basis for the indirect and cumulative effects analysis for this project.

Direct impacts are defined by the Council on Environmental Quality (CEQ) Regulations as *“effects which are caused by the action and occur at the same time and place.”* For this project, the direct impact would be the use of a particular piece of property for right-of-way for a project alternative.

Indirect impacts are defined by the CEQ Regulations as *“effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.”* For this project, an indirect impact would be the change in the use of a particular piece of property as a result of a project alternative.

In addition to the proposed I-65 to US 31W Connector project located in Warren County, Kentucky, there are “other” past, present, and reasonably foreseeable future actions within the project area. For this project, Scotty’s Industrial Park and Kentucky Transpark are examples of other actions within the project area that are changing the use of particular pieces of property. Taken together, the cumulative effects are the impacts to the environment from the I-65 to US 31W Connector project (including both direct and indirect impacts) and from other past, present, and reasonably foreseeable future actions.

The Draft and Final Environmental Impact Statements for this project will present an analysis of the cumulative impacts for each resource, ecosystem, and human community in the project area. This analysis will be based upon the anticipated land use changes for the project alternatives described and documented in this technical report.

II. Methodology

The land use analysis for the I-65 to US 31W Connector project is based upon methods detailed in “*Considering Cumulative Effects Under the National Environmental Policy Act*” (Council on Environmental Quality, January 1997); “*Desk Reference for Estimating the Indirect Affects of Proposed Transportation Projects*” (National Cooperative Highway Research Program Report 466, 2002), “*Indirect and Cumulative Impact Assessment in the Highway Project Development Process*” (FHWA Position Paper, HEP-32, April 1992), and “*Consideration of Cumulative Impacts in EPA Review of NEPA Documents*” (EPA 315-R-99-002, May 1999).

The methodology for conducting the land use analysis followed these steps:

- 1) Identify the project study area;
- 2) Analyze zoning and land use development within the project study area to determine past and present land use changes;
- 3) Calculate forecasted population and employment growth within the project study area;
- 4) Convert forecasted population and employment growth into new acres of development;
- 5) Use current zoning and land use changes within the project study area to determine reasonably foreseeable future actions of others;
- 6) Determine the amount and location of the indirect impacts.

The Kentucky State Data Center (KSDC) provided population forecasts for Warren County for the year 2030. The year 2030 employment forecasts for Warren County were developed to be consistent with the population forecasts. As part of the Bowling Green Regional Travel Model that covers Bowling Green and Warren County, the future socio-economic forecasts for population and employment growth were allocated to Traffic Analysis Zones. The Bowling Green Regional Travel Model is based on Traffic Analysis Zones (TAZ). These zones cover the entire study area for this project.

The allocation of the forecasts to the TAZs was based upon the existing and future land use plans for Bowling Green and Warren County. These forecasts were divided and distributed among approximately 140 TAZs by local planning, engineering, and transportation officials. These local officials used knowledge of local subdivision and rezoning activity, building permit activity, vacant land development constraints, and availability of public sewer service to establish the anticipated magnitude of population and employment growth by TAZ. The existing and future population and employment values for the entire 140 TAZs are presented in Table 6 and Figures 3 and 4 of the “Technical Memorandum: Traffic Analysis Draft Report, I-65 to US 31W EIS” (Kentucky Transportation Cabinet, Division of Multi-modal Programs, March 2004). The existing and future population and employment for the TAZs within the study area for this project are shown in Table 1, herein.

III. Analysis

Step 1 – The project is located in the Bowling Green / Warren County area, which is in southwest-central Kentucky, about 22 miles north of Tennessee. Bowling Green and Warren County serve as the main economic center for numerous surrounding counties, and are both growing in population. In 2000, Bowling Green had a population of 49,296, which is estimated to have increased to 50,663 in 2003. And Warren County had a 2000 population of 92,522, which is estimated to have increased by 3,256 to 95,778 in 2003. Bowling Green and Warren County host a number of shopping areas, employment centers, governmental services, regional hospitals, and educational facilities used by residents of south central Kentucky and a small portion of north central Tennessee.

The I-65 to US 31W Connector Project Study Area was determined to contain approximately 45 square miles. The Project Study Area is generally bounded by: Interstate Drive (KY446) to the west, one mile north of and parallel to US 31W to the north, one quarter mile east of the Village of Oakland to the east, and I-65 to the south (see Figure 1).

In determining the boundaries for this Project Study Area, the two major criteria are: (1) all project alternatives must be contained within this Project Study Area and (2) all properties that could benefit from the changes in accessibility caused by an alternative must be within the Project Study Area. All project alternatives are within the Project Study Area shown in Figure 1.

The second criteria deals with accessibility. Land use changes are directly related to changes in accessibility. As accessibility to a piece of property is improved, that property becomes more attractive for development. The Project Study Area in Figure 1 includes all property that may experience a change in accessibility as a result of a project alternative.

The alternatives studied for the I-65 to US 31W Connector for the land use analysis include:

- Alternative 3+4 North Reconstruct existing roads
- Alternative 3+4 South Reconstruct existing roads
- Alternative 5 New I-65 to US 31W Connector
- Alternative 6 New I-65 to US 31W Connector–US 68/KY 80 Interchange

Both Alternatives 5 and 6 have several alignment options (red, blue, and orange options) for the southern terminus with I-65. These options involve different interchange locations on I-65. These options will require differing amounts of acreage for right-of-way and therefore, different direct impacts. From an accessibility perspective, the alignment options for each alternative will provide similar accessibility benefits to properties in the Project Study Area. With similar accessibility, the amount of indirect land use impacts is not expected to differ between the various alignment options.

From US 31W east to the vicinity of entrance to the Bowling Green Metal Forming plant (approximately 1.3 miles), US 68/KY 80 is being widened and reconstructed to a five lane facility to address immediate safety and capacity needs expected to be generated by traffic going to and from the plant, which is programmed to be in full operation in early 2006. This improvement is shown as a current safety improvement project on several figures in this report.

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Step 2 – Past and present zoning and land uses within the Project Study Area were determined. To help identify past and present development, a review of existing road maps, aerial photography, zoning maps, water and sewer maps, planning documents and development plans was conducted and on-site reconnaissance were made. The following documents were reviewed for growth and development trends in the study area:

- *Technical Memorandum: Traffic Analysis Draft Report, I-65 to US 31W EIS*, (March 2004) Kentucky Transportation Cabinet, Division of Multi-modal Programs.
- *Warren County, Agricultural Statistics*, (Published December 1999) Kentucky Agricultural Statistical Service.
- *1990 Comprehensive Plan for Warren County, Kentucky*. City-County Planning Commission of Warren County, Kentucky.
- *1990 Comprehensive Plan for Warren County, Part III The Policy Plan*, As Amended, Re-numbered and Re-adopted on 01-02-03, Effective Date of 02-01-03. Subsequent Amendments on 04-17-03 and 10-16-03 noted at each specific section.
- *Smiths Grove Rural Village Focal Point Plan* (Adopted April 2001) City-County Planning Commission of Warren County, Kentucky.
- *Oakland Rural Village Focal Point Plan* (Adopted November 1999) City-County Planning Commission of Warren County, Kentucky.
- *Joint Zoning Ordinance for Warren County, Kentucky* (December 2001) City-County Planning Commission of Warren County, Kentucky.
- *Zoning Maps of Warren County* (Updated January 2004) City-County Planning Commission of Warren County, Kentucky.
- *Building Permit & Subdivision Activity Analysis Year 2000 Update* (Published January 2001) City-County Planning Commission of Warren County, Kentucky.
- *Kentucky Trimodal Transpark Environmental Assessment* (February 18, 2001) Wilbur Smith Associates et. al.

These documents showed that water lines and sewer lines serve much of the study area. A water force main exists along US 68/KY 80 from US 31W to Oakland. A force main exists along US 31W from KY 446 to US 68/KY 80. The Warren County Water District is proposing to construct transmission facilities for conveying drinking water in northern Warren County. Existing water transmission lines supplying much of the northern half of Warren County were constructed in the late 1960s and 1970s. Since that time, significant residential, commercial and industrial growth occurred in this area and water system improvements are needed to accommodate this growth.

The first segment, the Southern Section, is a 20-inch water supply line that starts near the Barren River (across the river from the water treatment facility) in Bowling Green. The Southern Section generally parallels the CSX Railroad right of way, to a point approximately 6.5 miles east-northeast. The Southern Section terminates on US 68/KY 80 near the Bowling Green Metal Forming Plant and Scotty's Industrial Park. A second segment, a 10- or 12-inch water line, called the Northern Section, begins at a point along US 31W. This 6.1-mile segment will follow the existing highway eastward until it reaches KY 179, the Oakland Road. At this point, the Northern Section will change to a southeasterly direction and follow the roadway to its junction with US 68/KY 80 (Glasgow Road).

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In addition to the review of existing road maps, aerial photography, zoning maps, planning documents and development plans, there was coordination with the City-County Planning Commission of Warren County to identify past, present, and reasonably foreseeable future development or actions within the I-65 to US 31W Connector study area. Appendix B describes the coordination efforts. The Warren County Planning Commission provided maps showing zoning and subdivision changes within the Study Area since the 1960's. Using this information, Figure 2 shows the history of residential, commercial, and industrial growth within the Study Area since the 1960's. This figure shows that this section of Bowling Green and Warren County has experienced regular and consistent growth since the 1960's.

Current development includes projects that are under construction. One of the major changes in land use within the study area is the Kentucky Transpark. Ground-breaking for this high-tech commerce and business park occurred on August 25, 2003. In February of 2004, Cosma International, a subsidiary of Magna International, Inc., announced the purchase of 133.25 acres from the Kentucky Transpark to construct a metal forming plant and in February 2005 construction began on a technical training center. The construction of the Bowling Green Metal Forming plant and the technical training center are examples of current development. This development is not dependent on or indirectly caused by the I-65 to US 31W Connector and for this project is categorized as "other" impacts.

Proposed future development includes projects where the land has been rezoned, a site plan developed, and/or lots have been sold. The Kentucky Transpark is an example of proposed future development. According to the Kentucky Transpark Master Plan, dated October 15, 2004, the Kentucky Transpark includes 834 acres that are either: (1) owned or optioned by Kentucky Transpark; or (2) owned or optioned by Bowling Green Metal Forming. This development is not dependent on or indirectly caused by the I-65 to US 31W Connector and for this project is categorized as "other" impacts. Appendix A includes the most current plan for Kentucky Transpark.

Step 3 – Following the discussion of past and present actions in the Project Study Area, the forecasted population and employment growth within the area was determined. The 2030 population and employment forecasts are for each TAZ. For the TAZs, they were based on the county level forecasts developed by the Kentucky State Data Center. These forecasts reflect the transportation plan for the area of which a connector between I-65 and US31W is a part. Figure 3 shows the TAZs within the Project Study Area. Table 1 shows the year 2000 values and the 2030 forecasts for the TAZs within the Project Study Area.

Table 1 – 2000 and 2030 Population and Employment by TAZ within Project Study Area				
TAZ	Population		Employment	
	2000	2030	2000	2030
49	1051	2102	74	134
50	57	74	1421	2383
100	464	2129	119	162
101	1378	1718	981	3337
102	33	67	0	268
118	1485	1794	413	488
319	812	1166	176	176
339	0	0	0	10755
9121	247	373	4	254
Totals for Area	5,527	9,423	3,188	17,957
Total Warren County	92,522	142,185	58,637	100,320

Table 1 also shows the total 2000 and 2030 population and employment figures for Warren County. The Project Study Area is forecasted to increase in population by approximately 3,896 persons which is 7.8% of the total population growth in Warren County. Employment is forecasted to increase by 14,769 jobs in the Project Study Area which is 35.4% of the total employment growth in Warren County. These values show that growth is forecasted to occur throughout Warren County and that the growth in the Project Study Area is a small portion of this total growth.

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Step 4 – Using the forecasts, the growth in population and employment from 2000 to 2030 was converted into acres of land. This calculation was based on several assumptions. First, the Kentucky State Data Center forecasts a value of 2.34 persons per household by the year 2030 in Warren County. The difference between the future and the existing population was divided by 2.34 to give the growth in the number of households.

Second, the conversion of households or housing units into acres was accomplished using a value of 3 households or housing units per acre. This value is for single-family detached housing and comes from the “Trip Generation- 6th Edition” Institute of Transportation Engineers, 1997. The growth in the number of housing units was divided by 3 to give the growth in residential acres. This growth in residential acres is shown in Table 2.

The Kentucky State Data Center forecasts for employment were converted into acres of land using values from the “Trip Generation- 6th Edition” Institute of Transportation Engineers, 1997. For general heavy industrial uses, a value of 8.23 employees per acre was used. In February of 2004, Cosma International, a subsidiary of Magna International, Inc., announced the purchase of 133.25 acres from the Kentucky Transpark (article posted on Kentucky.com website on February 6, 2004). The article stated that the plant will be under the name of the Bowling Green Metal Forming LLC and will hire 1,100 people. This converts to a value of 8.26 employees per acre which corresponds closely to the average value used in the employment conversion.

Table 2 – Forecasted Development by TAZ for all Build Alternatives			
TAZ	Growth in Residential Acres	Growth in Manufacturing Acres	Total Acres
49	150	7	157
50	2	117	119
100	237	5	242
101	48	286	334
102	5	33	38
118	44	9	53
319	50	0	50
339	0	1307	1307
9121	18	30	48
Totals	554	1794	2348

Table 2 shows the resulting acres of forecasted development for each of the TAZs within the Study Area. It is important to recognize that the forecasted development in the study area shown in Table 2 reflects the transportation plan including the building of a connector between I-65 and US31W. For this project, the forecasted development in Table 2 is for all build alternatives.

Step 5 – This step involves determining the reasonably foreseeable future actions of others within the

Project Study Area. As Figure 2 showed, the Project Study Area has seen much development activity by others over past years. This activity continues at the present time with the construction of the Bowling Green Metal Forming plant.

In meeting with local planning officials (see Appendix B), the Project Study Area has seen many acres of land rezoned in anticipation of actions of developers. These lands have been rezoned because development is reasonably foreseeable in the future on these lands. These reasonably foreseeable future actions by other developers are occurring without the connector project. These actions are not dependent on or indirectly caused by the I-65 to US 31W Connector. If the No-Build Alternative is selected, these actions are still anticipated to occur.

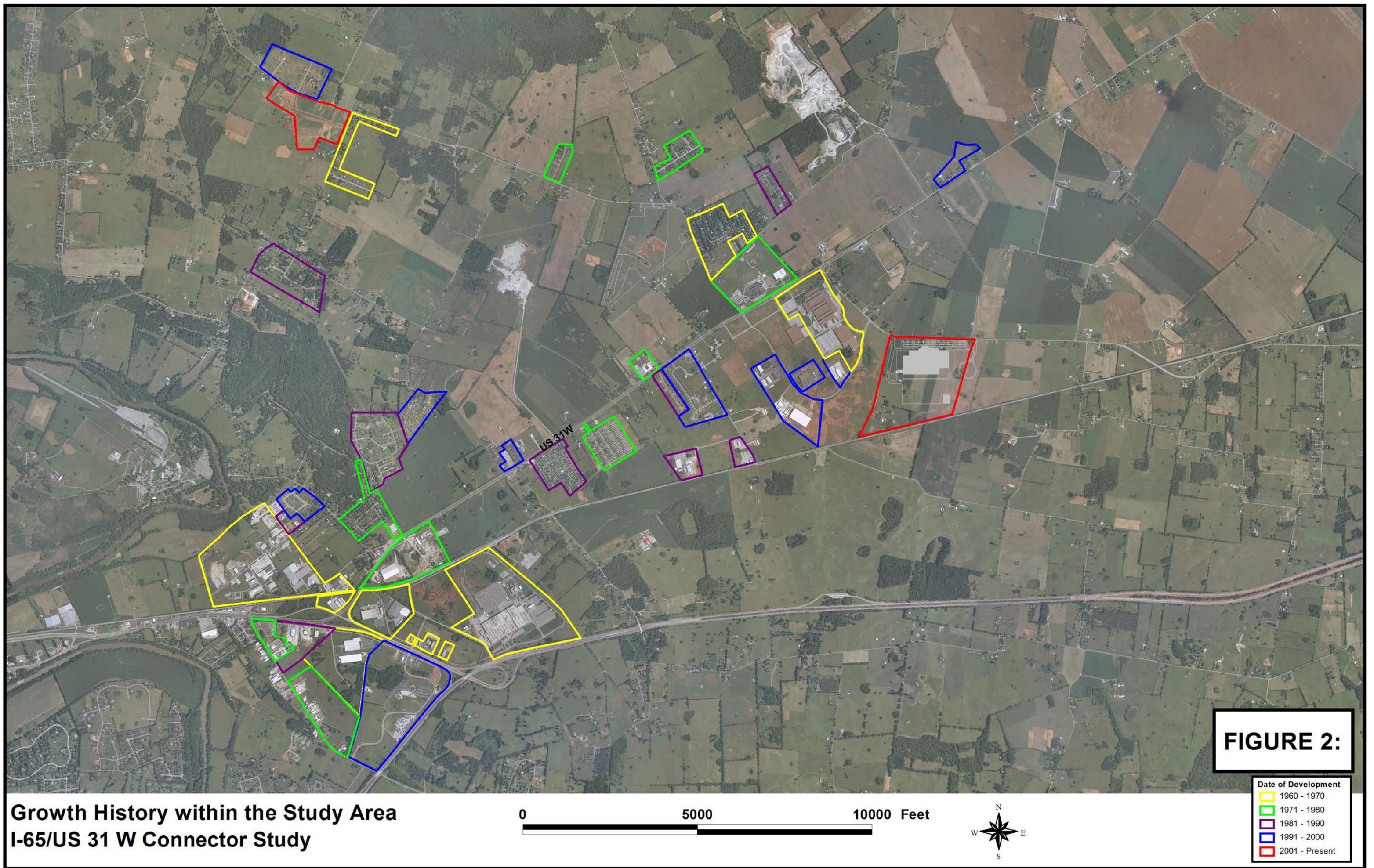


Overview of Area
I-65/US 31 W Interchange Connector Design Project



FIGURE 1:

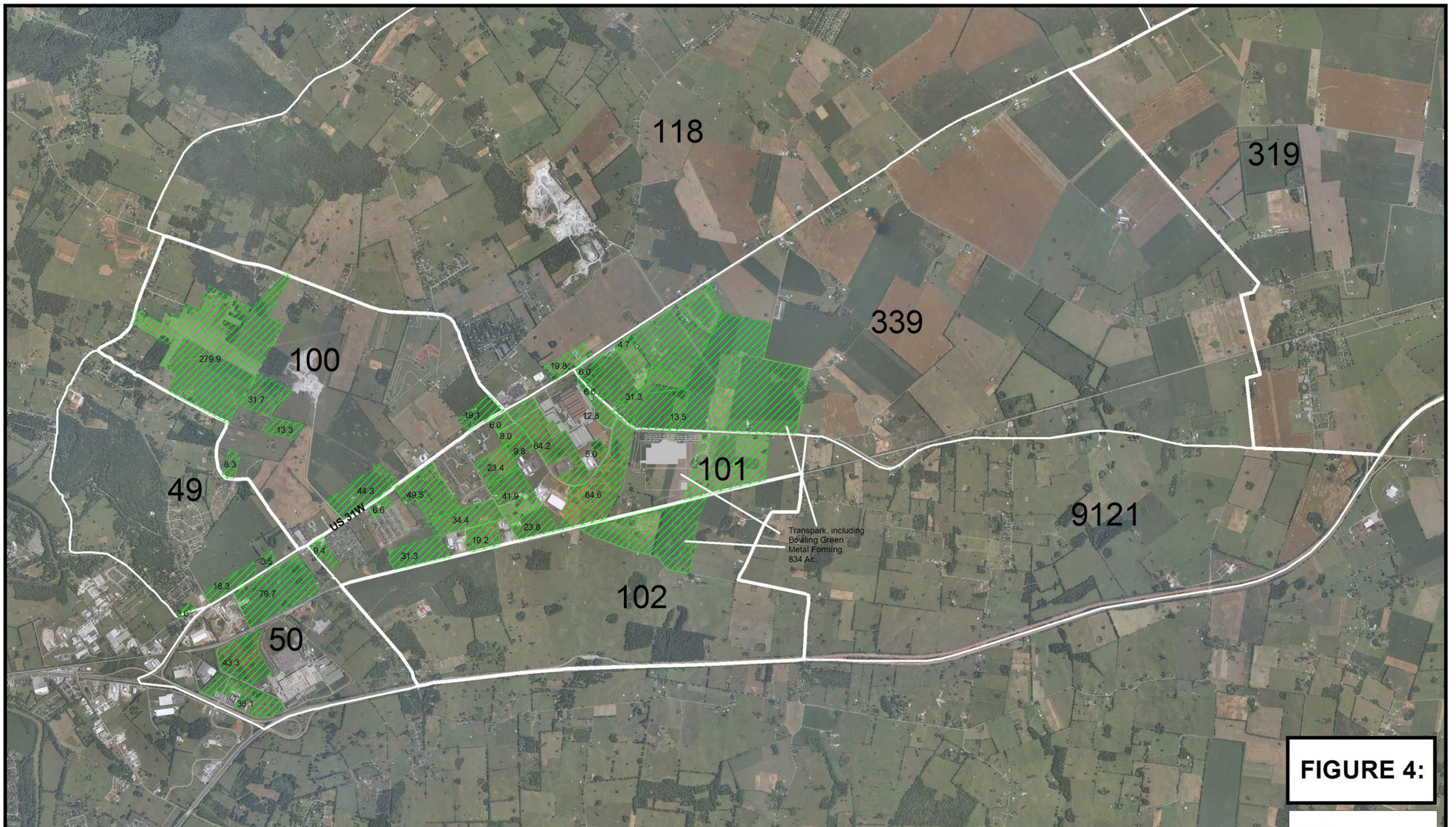
 Roads





Traffic Analysis Zones (TAZ) within the Study Area
I-65/US 31 W Connector Study

FIGURE 3:



**Land Use Changes for No-Build Alternative
I-65/US 31 W Connector Study**

0 6000 12000 Feet



FIGURE 4:

Other Actions

TAZ Boundaries



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These reasonably foreseeable future actions by others are shown in Figure 4 as the land use changes for the No-Build Alternative. The location of these actions as well as the acreage of the rezoned land is shown. The total acreage of these actions is 1,926 acres. This acreage includes 834 acres for Kentucky Transpark (see Appendix A) and approximately 1,092 acres of other land rezoned for development. Table 3 shows this acreage by TAZ.

Table 3 – Reasonably Foreseeable Future Actions by Others shown by TAZ		
TAZ	Total Acres	
49	25.4 acres	rezoned land
50	158.1 acres	rezoned land
100	396.7 acres	rezoned land
101	430 acres	rezoned land
102	-	-
118	19.8 acres	rezoned land
319	-	-
339	62 acres	rezoned land
9121	-	-
Kentucky Transpark	834 acres	owned or optioned
Total:	1926 acres	

The total forecasted development acres in Table 3 that are categorized as reasonably foreseeable future actions by others with the connector not built (No-Build Alternative) are 1,926 acres. The difference between the total of the acres shown in Table 2 (2,348 acres) and the total of the acres shown in Table 3 (1,926 acres) is 422 acres. These acres are not rezoned lands and as such are not categorized as reasonably foreseeable actions by others. Since these acres are not future actions of others and are not direct impacts due to the connector, they therefore represent the indirect impacts due to the I-65 and US 31W Connector.

For each project alternative, the amount of indirect impacts would be similar but the location of these impacts would be different. While the accessibility to properties within the Project Study Area varies significantly

between alternatives, the accessibility to the entire Warren County varies minimally between alternatives. The Bowling Green Regional Travel Model computes vehicle hours of travel by alternative. The differences in impacts between the project alternatives using vehicle hours of travel over Warren County are less than 0.1%. From a county perspective, all alternatives have a similar impact on improving accessibility. If the accessibility is similar, then the attractiveness for development is similar resulting in similar magnitude of indirect impacts for all alternatives.

Within the Project Study Area, the impacts to accessibility vary greatly between alternatives. This is reflected in the significant changes in traffic patterns between alternatives. Changes in accessibility mean that the attractiveness of property for development will vary between alternatives. Therefore, property that would develop due to improved accessibility from one alternative may not develop for another alternative. For each alternative the property impacted by the improved accessibility will be different. Therefore, the location of the indirect impacts will vary between alternatives.

Step 6 -Having identified the number of acres of land that are indirect impacts of the I-65 and US 31W Connector, the last step in the process involves determining the location of the 422 acres of indirect land use impacts.

To determine the location of the indirect impacts within the study area, the analysis considered proximity to the Connector alternative; proximity to other major highways including the I-65 interchanges, US 68/KY 80, and US 31W; access to water and sewer lines; the availability of developable land; and access to the CSX railroad.

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IV. Results

Based upon the 6 step methodology for assessing the anticipated land use changes, the results of the analysis are summarized in Table 4. This table shows the direct impacts, the indirect impacts, the reasonably foreseeable future actions of others, and the total land use changes by alternative. Figures 5 – 8 show the estimated locations of the indirect impacts and the reasonably foreseeable future actions by others. The direct impacts occur within the right-of-way of each alternative. The impacts associated with each alternative are discussed separately.

Table 4 – Summary of Land Use Changes Analysis

Alternative	Direct Impacts (acres)	Indirect Impacts (acres)	Other Actions (acres)	Total Land Use Changes Impacts (acres)
No-Build	-	-	1926	1926
Alternative 3+4 - North	260	422	1926	2608
Alternative 3+4 – South	257	422	1926	2605
Alternative 5	224	422	1926	2572
Alternative 6	229	422	1926	2577

No-Build Alternative

As already discussed, the No-Build Alternative would involve no improvements to the roadway system. For the No-Build Alternative, there are no direct or indirect impacts. The only impacts are the reasonably foreseeable future actions by others. These other actions are 1,926 acres giving a total land use change of 1,926 acres.

Alternative 3 + 4 North

Alternative 3+4 (both the North and South options) would involve the total reconstruction of several existing roadway facilities and elements, as follows: the I-65–KY 446 interchange; KY 446 for 1.0 mile, which is its entire length; the KY 446–US 31W partial interchange; US 31W for 3.5 miles northwest to the US 68/KY 80 intersection; US 68/KY 80 for 5.5 miles west to I-65; and conversion of the I-65–US 68/KY 80 half diamond interchange to a full diamond interchange. Alternative 3+4 North and 3+4 South differ where they parallel and cross the CSX rail line. The South option crosses the CSX line at the existing location, then parallels the railroad and US 68/KY 80 to the south. The North option first parallels the railroad to the north and then crosses it about 8,500 feet (or 1.6 miles) east of the existing crossing.

This alternative was designated name 3+4 because it is a combination of the previously considered Alternatives 3 and 4. Alternative 3 involved only the reconstruction of the KY 446–I-65 interchange, KY 446, the KY 446–US 31W partial interchange, and US 31W from KY 446 to US 68/KY 80. Alternative 4 involved only the reconstruction of US 68/KY 80 from its intersection with US 31W north to I-65, and the conversion of the I-65 half interchange to a full interchange.

The direct impacts due to the right-of-way needs for Alternative 3 + 4 North are 260 acres. The indirect impacts are forecasted to be 422 acres. The northern location of this alternative will mean the existing farmland north of the CSX railroad will have access to a 4 lane highway as well as the CSX railroad line. Water and sewer lines could be extended along the proposed highway. The terrain in this area is characterized by rolling hills with broad, gently sloping karst features. These conditions are more favorable, as compared to other karstic areas, for the excavation activities needed by developers.

The indirect impacts are anticipated to be located in three areas (see Figure 5). These areas are: (1) along US 31W between KY 446 and US 68/KY 80; (2) along the eastern edge of the Kentucky Transpark; and (3) at the I-65 and US 68/KY 80 in-

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terchange around Oakland. Along US 31W, the indirect impacts would “fill in” those areas that are currently undeveloped and have not been rezoned. The second area is along the east side of Kentucky Transpark and is shown in Appendix A as part of the Master Plan for the Kentucky Trimodal Transpark. The land in this area is currently owned by others and is approximately 340 acres. According to the Master Plan shown in Appendix A, there are two historic sites within this area that would be left alone. The third area is at the I-65 and US 68/KY 80 interchange. Alternative 3+4 North would provide access to this land and its proximity to the interchange makes this area attractive to future development.

The reasonably foreseeable future actions of others in the study area are estimated to be 1,926 acres for this alternative (see Table 4 and Figure 5). The total land use changes would be 2,608 acres.

Alternative 3 + 4 South

Alternative 3+4 (both the North and South options) would involve the total reconstruction of several existing roadway facilities and elements, as follows: the I-65–KY 446 interchange; KY 446 for 1.0 mile, which is its entire length; the KY 446–US 31W partial interchange; US 31W for 3.5 miles northwest to the US 68/KY 80 intersection; US 68/KY 80 for 5.5 miles west to I-65; and conversion of the I-65–US 68/KY 80 half diamond interchange to a full diamond interchange. Alternative 3+4 North and 3+4 South differ where they parallel and cross the CSX rail line. The South option crosses the CSX line at the existing location, then parallels the railroad and US 68/KY 80 to the south. The North option first parallels the railroad to the north and then crosses it about 8,500 feet (or 1.6 miles) east of the existing crossing.

The direct impacts due to the right-of-way needs for Alternative 3 + 4 South are 257 acres. The indirect impacts are forecasted to be 422 acres. The southern location of this alternative will mean the existing farmland south of the existing 2 lane US 68/KY 80 will have access to a 4 lane highway. But because of the location of the existing US 68/KY 80, this land would not have access to the CSX railroad line. Water and sewer lines currently exist along the existing US 68/KY 80 and could be extended to serve property along the proposed highway. The terrain in this area is characterized by steep sinkholes. This area is not well suited for excavation activities and is less attractive to industrial and commercial development than land located north of the CSX railroad.

These indirect impacts are anticipated to be located in three areas (see Figure 6). These areas are: (1) along US 31W between KY 446 and US 68/KY 80; (2) along the eastern edge of the Kentucky Transpark; and (3) at the I-65 and US 68/KY 80 interchange around Oakland. Along US 31W, the indirect impacts would “fill in” those areas that are currently undeveloped and have not been rezoned. The second area is along the east side of Kentucky Transpark and is shown in Appendix A as part of the Master Plan for the Kentucky Transpark. The land in this area is currently owned by others and is approximately 340 acres. According to the Master Plan shown in Appendix A, there are two historic sites within this area that would be left alone. The third area is at the I-65 and US 68/KY 80 interchange. Alternative 3+4 would provide access to this land and its proximity to the interchange makes this area attractive to future development.

The reasonably foreseeable future actions of others” in the study area are estimated to be 1,926 acres for this alternative (see Table 4 and Figure 6). The total land use changes would be 2,605 acres.

Alternative 5: New I-65 to US 31W Connector

Alternative 5 would involve construction of a four-lane, divided interstate connector, with fully controlled access, from I-65 north 2.5 miles to US 31W. The new road would bridge over the CSX railroad, and then bridge over (rather than provide an interchange with) US 68/KY 80. The I-65 interchange would be a trumpet-design, located near milepost 31, between the existing KY 446 interchange (Exit 28) and the Oakland/KY 101 half-interchange (Exit 38). It would terminate with an at-grade intersection with US 31W and involve the widening of US 31W to a four-lane depressed median facility for 1 mile between US 68/KY 80 and the connector.

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The direct impacts due to the right-of-way needs for Alternative 5 are 224 acres. Since Alternative 5 has several options (red, blue, and orange) and each option has slightly different direct impacts, the most conservative option (orange) having the most direct impacts was selected for inclusion in Table 4. The indirect impacts are estimated to be 422 acres. Without an interchange with US 68/KY 80, Alternative 5 provides no access for any lands between I-65 and US 31W.

The indirect impacts are estimated to be located in two areas (see Figure 7). These areas are: (1) along US 31W from the intersection with US 68/KY 80 to the intersection with the new Connector and (2) along the eastern edge of the Kentucky Transpark. The first area is along US 31W which would be upgraded to a 4-lane facility from US 68/KY 80 to the connector. Access would be provided to the land along US 31W. The second area is along the east side of Kentucky Transpark and is shown in Appendix A as part of the Master Plan for the Kentucky Trimodal Transpark. The land in this area is currently owned by others and is approximately 340 acres. According to the Master Plan shown in Appendix A, there are two historic sites within this area that would be left alone.

The reasonably foreseeable future actions of others in the study area are estimated to be 1,926 acres for this alternative (see Table 4 and Figure 7). The total land use changes would be 2,572 acres.

Alternative 6: New I-65 to US 31W Connector - US 68/KY 80 Interchange

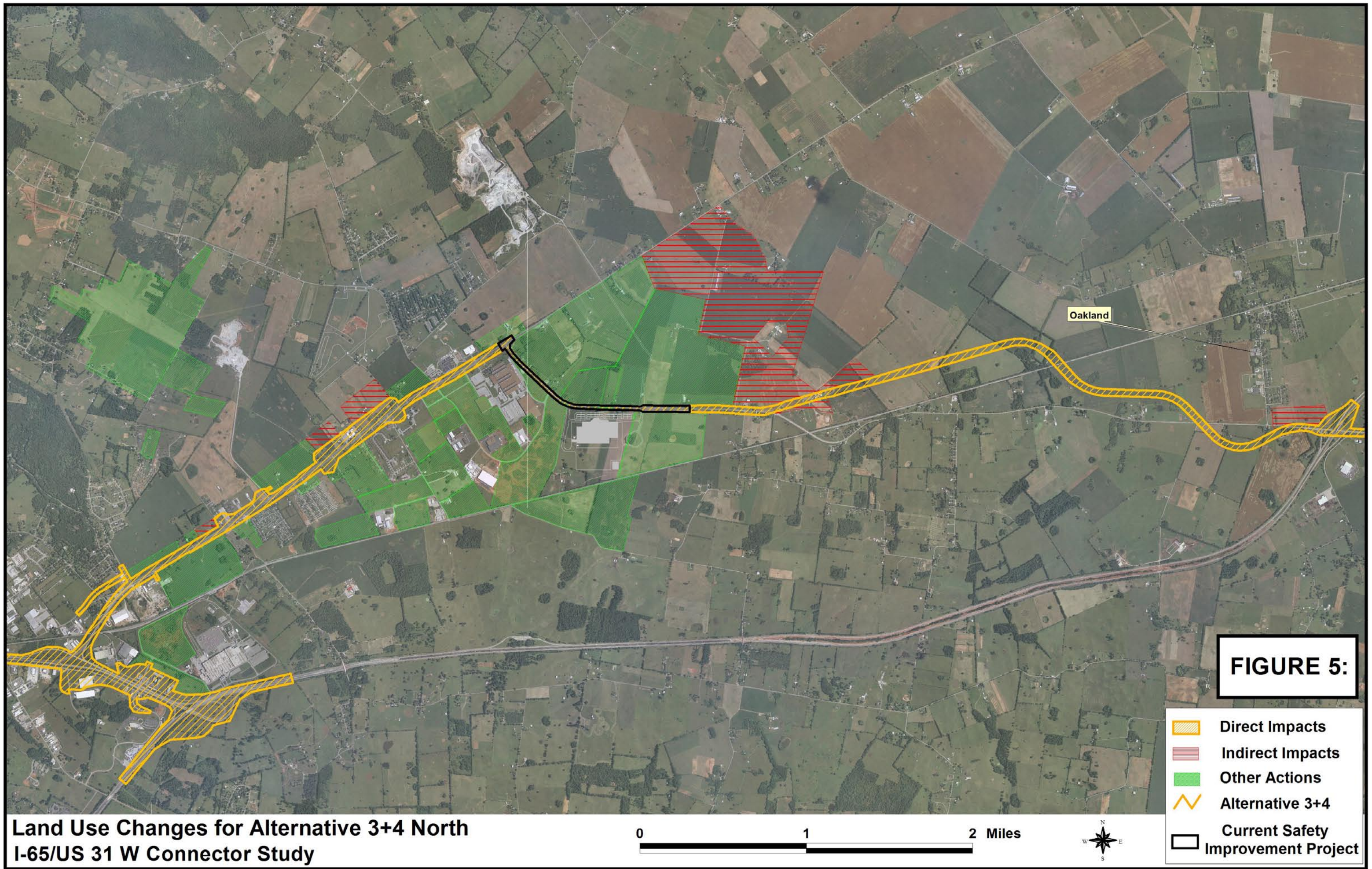
Alternative 6 is the same as Alternative 5 except a grade-separated diamond interchange would be provided with US 68/KY 80. As a result of the interchange with US 68/KY 80, this alternative would also include reconstructing US 68/KY 80 as it approaches and goes through the interchange. And like Alternative 5, this scenario would widen US 31W from the terminus of the connector west 1 mile to US 68/KY 80.

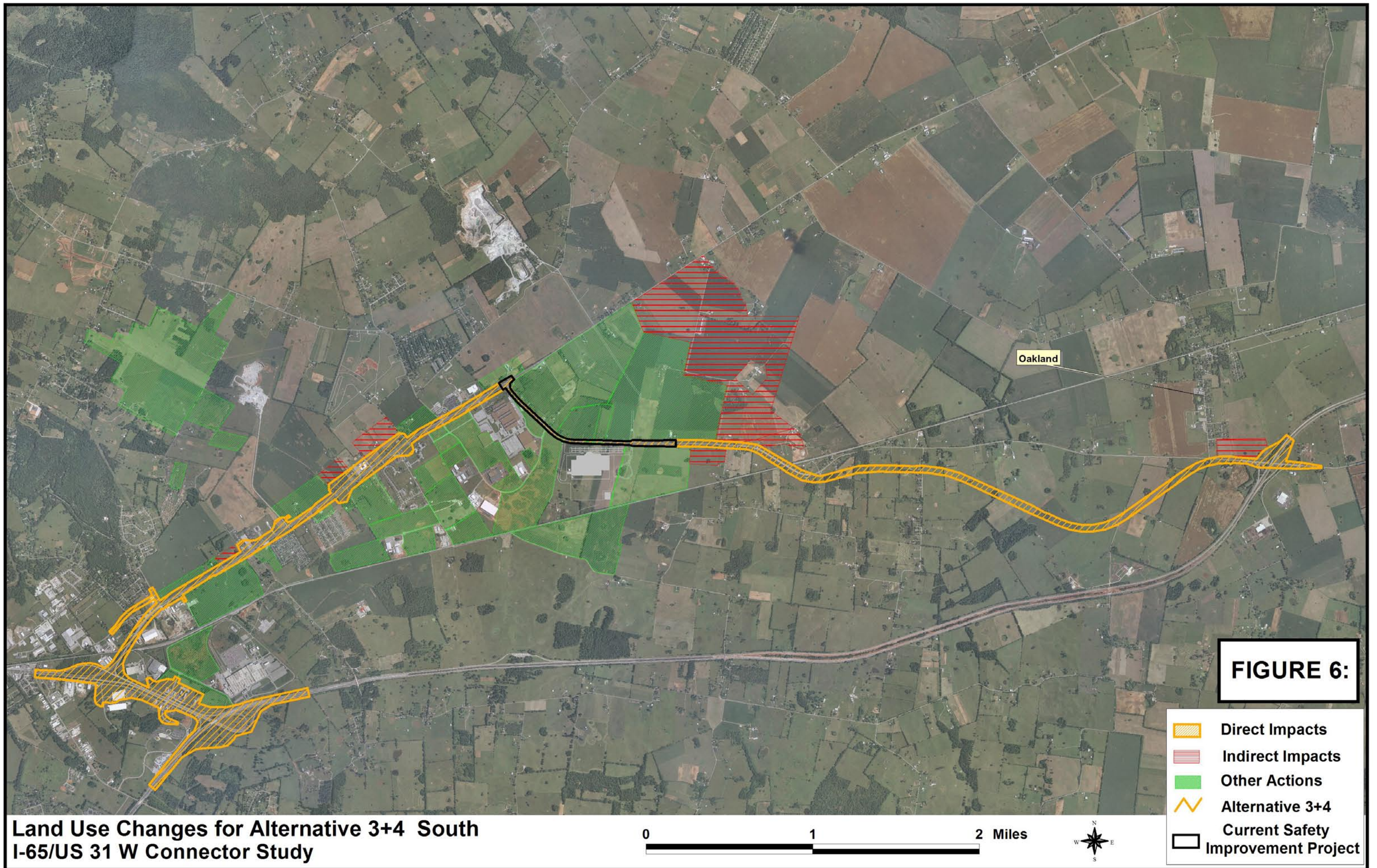
The direct impacts due to the right-of-way needs for Alternative 6 are 229 acres. Since Alternative 6 has several options (red, blue, and orange) and each option has slightly different direct impacts, the most conservative option (orange) having the most direct impacts was selected for inclusion in Table 4. The indirect impacts are estimated to be 422 acres.

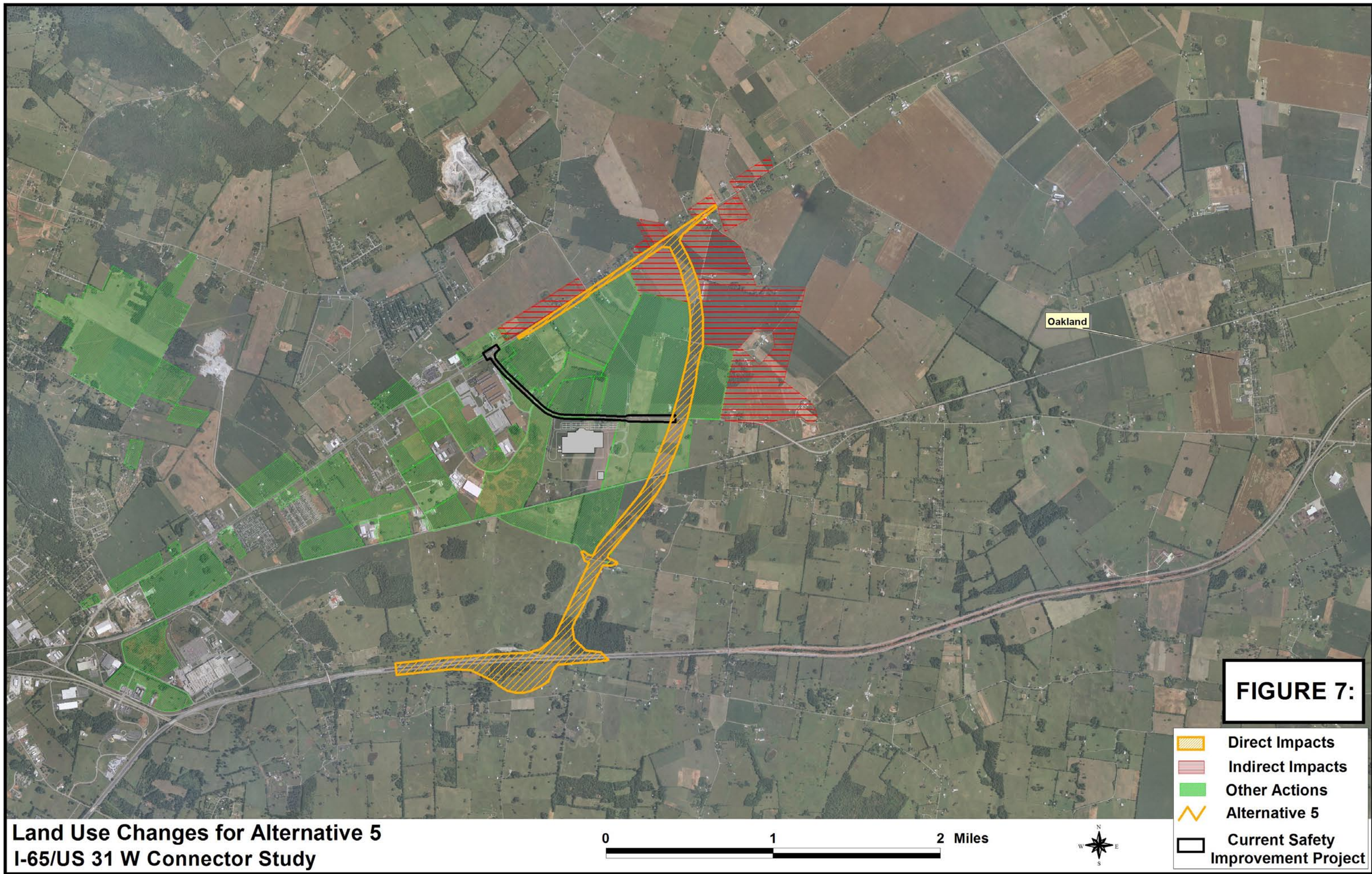
The indirect impacts are estimated to be located in three areas (see Figure 8). These areas are: (1) along US 31W from the intersection with US 68/KY 80 to the intersection with the new Connector; (2) along the eastern edge of the Kentucky Transpark; and (3) to the east of the interchange with the Connector and US 68/KY 80. The first area is along US 31W which would be upgraded to a 4-lane facility from US 68/KY 80 to the connector. Access would be provided to the land along US 31W. The second area is along the east side of Kentucky Transpark and is shown in Appendix A as part of the Master Plan for the Kentucky Trimodal Transpark. The land in this area is currently owned by others and is approximately 340 acres. According to the Master Plan shown in Appendix A, there are two historic sites within this area that would be left alone.

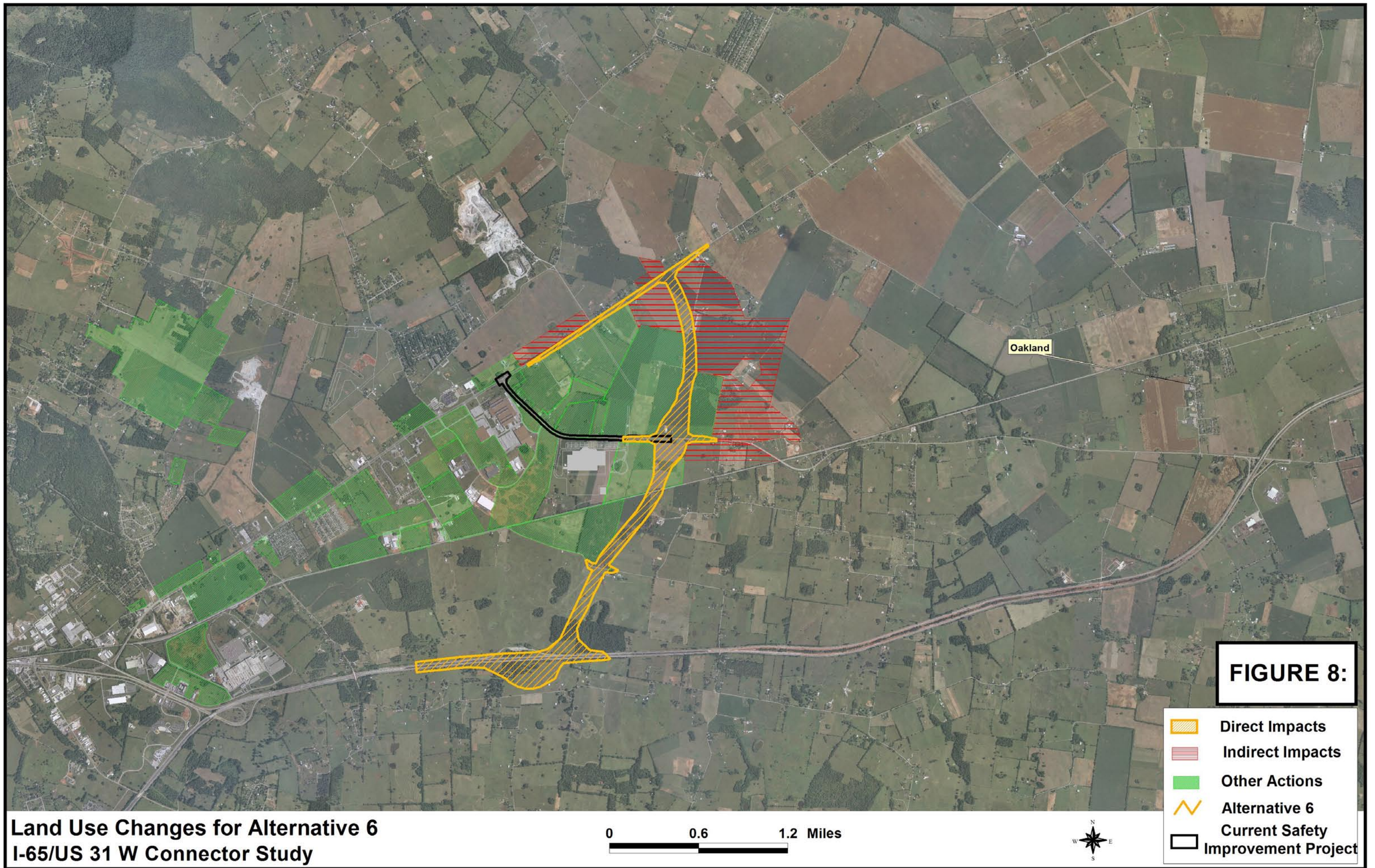
The interchange at US 68/KY 80, the presence of water lines and a force main along US 68/KY 80, and the proximity to the CSX railroad make the area to the east of the interchange attractive for development.

The reasonably foreseeable future actions of others in the study area are estimated to be 1,926 acres for this alternative (see Table 4 and Figure 8). The total land use changes would be 2,577 acres.









V. Conclusion

The land use analysis shows that the total land use impacts for each alternative are very similar and range between 2,572 and 2,608 acres. The differences are in the amount of direct impacts and in the location of the indirect impacts. While each of the alternatives will have indirect impacts as a result of land use changes in the study area, the location of these impacts are anticipated to vary depending upon access to available land, location of intersections and interchanges, and access to infrastructure (i.e., water lines, sewer lines, and CSX railroad). The No-Build Alternative would have reasonably foreseeable future actions of others but no direct or indirect impacts. The total land use impacts for the No-Build Alternative are 1,926 acres.

Alternative 3+4 North will enable existing farmland on rolling hills to have access to a new 4 lane highway. Water and sewer lines could be extended along the proposed highway. If needed, a spur from the CSX railroad line could be built to access these lands. Alternative 3+4 South will enable the existing farmland south of the existing 2 lane US 68/KY 80 to have access to a 4 lane highway. But because of the location of existing US 68/KY 80, this land would not have access to the CSX railroad line. Water and sewer lines currently exist along the existing US 68/KY 80 and could be extended to serve property along the proposed highway. Alternative 5 would have indirect impacts along US 31W. The lack of access from the new connector road to US 68/KY 80 would not be conducive to development along US 68/KY 80. Alternative 6 with the interchange at US 68/KY 80 will enable land around the interchange to have access to a new 4 lane highway.

The reasonably foreseeable future actions of others are forecasted to be 1,926 acres. It is important to recognize that the extension of infrastructure and zoning changes in the study area has created an area that is attractive for growth and development at the present time. The Bowling Green Metal Forming plant and the technical training center are examples of development that is currently under construction. Many properties in the Project Study Area have been rezoned and are in the process of being developed. These properties include the Kentucky Transpark, Scotty's Industrial Park, and Kelly Road Industrial Park.

APPENDIX A

**Kentucky Transpark
Master Plan
Dated October 15, 2004**

Kentucky Transpark forwarded the most recent version of the Master Plan, dated October 15, 2004. The plan included 1173.65 acres. The ownership breaks down as follows:

Kentucky Transpark (Owned/Option)-	614.2 acres
Magna* (owned)-	133.25 acres
Magna* (option)-	86.5 acres
Owned by Others-	339.7 acres
Total-	1173.65 acres








Of the total acres included in the plan, the proposed use is as follows:



Lots 1-5	
Light Industrial-	218.9 acres
Lots 3,6,8,10,11,12,13,16	
Heavy Industrial-	409.3 acres
Magna* (Lots 14, 15, 16A)	
Heavy Industrial-	219.75 acres
Unknown-	325.7 acres
Total-	1173.65 acres

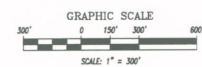
The Technical Training Center will be built on Lot 2A.

* Magna is Bowling Green Metal Forming



 STATE ROADS
 COUNTY ROADS
 PROPOSED ROADS
 BUSINESS PARK AREA
 DRAINAGE PONDS
 HISTORICAL SITE
 INDUSTRIAL

 PROPOSED SITE LINE
 SET BACK LINE



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Sudderth
& Etheredge,
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APPENDIX B



BERNARDIN LOCHMUELLER & ASSOCIATES, INC.

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Phone 812.479.6200 Toll Free 800.423.7411 Fax 812.479.6262

One Source for a World of Solutions

Meeting Minutes

Project: I-65 to US31W Connector, Warren County, KYTC Item No. 3-16.00

Purpose: Coordination with Warren County Planning Commission concerning land use changes associated with No-Build and Build Alternative scenarios.

Place: City-County Planning Commission - 1141 State Street, Bowling Green, Kentucky

Meeting Date: November 18, 2004 4:00PM CST

Prepared By: Rusty Yeager

In Attendance: Andy Gillies – Bowling Green/Warren County Planning Director
Eric Larson – Bowling Green/Warren County Engineering Manager
Kiersten Jagers – KYTC District 3
Tom Springer – Qk4
David Ripple - Bernardin, Lochmueller and Associates, Inc.
David Isley - Bernardin, Lochmueller and Associates, Inc.
Tom Cervone - Bernardin, Lochmueller and Associates, Inc.
Rusty Yeager – Bernardin, Lochmueller and Associates, Inc.

The primary focus of the coordination meeting was to brief the Planning Commission on the purpose of the indirect and cumulative analysis for the I-65 to US31W Connector study, and discuss where land use changes are anticipated under No-Build and various Build Alternative scenarios. David Isley initiated the meeting with an explanation of indirect and cumulative impacts, and established 2030 as the target design year for estimating reasonably foreseeable changes in land use within the study area. David Isley explained that the goal of the analysis was to identify areas or properties within the study area that are anticipated to undergo development within the next 25 years if no connector was constructed as well as additional areas that would develop as a result of project implementation.

Dave Isley continued to explain the methodology used to estimate the amount (i.e. acreage) of land use conversion anticipated over the next 25 years using Kentucky State Data Center forecasts and the Bowling Green Regional Travel Model to predict the population increase and employment increase within each of nine TAZs. The Planning Commission agreed that the average of 3 households per acre and 2.34 persons per household used to calculate land conversion for residential development seemed reasonable, but thought that the 10 employees per acre was high.

Andy Gillies indicated that the residential and employment growth upon which the acreage conversion was based may be an underestimate in light of the current state of development taking place within this part of Warren County. The original concept that residential and employment growth within each of the TAZs would be the same for the No-Build as for any of the Build Alternatives was discussed and ultimately rejected as not being plausible. It was agreed that any of the four conceptual Build Alternatives would likely induce additional growth (although not substantial) beyond that which is expected in the next 25 years without the connector. It was also agreed that the amount of acreage that would be converted as an indirect result of a Build scenarios is expected to be roughly the same for all alternatives. However, it was agreed that spatially such land use conversion would likely occur in different areas for each of the four alternative concepts – Alt. 5, Alt. 6, Alt. 3+4 north, and Alt. 3+4 south.

All three phases of the Kentucky Transpark development were discussed, including the current construction of Bowling Green Metal Forming, based on information from the most recent Kentucky Transpark Master Plan (October 15, 2004). Although the Kentucky Transpark master plan reports 1173 acres for the development, it was decided that only the 834

acres of property that is currently owned (including Bowling Green Metal Forming) or optioned by ITA should be included as property that is committed to development independent of a connector road. It was subsequently agreed that the remainder of the property that is currently shown as "owned by others" should be considered land that would be "indirectly" converted as a result of the I-65 to US31W connector road, regardless of which alternative was selected. A possible Transpark airport was also discussed in terms of a land use conversion anticipated by 2030. Since there are no plans or commitments to pursue an airport, the group was in agreement that any land use conversion is speculation and should not be considered in the analysis of the connector project.

Andy Gillies and Eric Larson identified several locations in addition to the Kentucky Transpark within the study area that have recently been rezoned or soon would be and noted that all these areas would likely be developed either residentially or industrially over the next 25 years even without the connector project. These areas were marked on the exhibit map to be designated as "other actions" for the purposes of the land use analysis. Using transportation access and the utility infrastructure (primarily access to water mains), the attendees worked together to identify areas along each of the four alternative concepts where indirect development would most likely occur. The three general areas identified included: south of Oakland, between the CSX railroad and US31W east of the rezoned portion of the Transpark, and along US31W between KY446 and the proposed intersection of Alternatives 5 and 6.

The meeting adjourned at approximately 6:00 PM CST

End of Minutes



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One Source for a World of Solutions

Meeting Minutes

Project: I-65 to US31W Connector, Warren County, KYTC Item No. 3-16.00

Purpose: Coordination with Warren County Planning Commission concerning land use changes associated with No-Build and Build Alternative scenarios.

Place: City-County Planning Commission - 1141 State Street, Bowling Green, Kentucky

Meeting Date: January 19, 2005 10:00 AM CST

Prepared By: David Isley

In Attendance: Andy Gillies – Bowling Green/Warren County Planning Director
Eric Larson – Bowling Green/Warren County Engineering Manager
Tonya Colley – Bowling Green/Warren County GIS Manager
David Isley - Bernardin, Lochmueller and Associates, Inc.
Rusty Yeager – Bernardin, Lochmueller and Associates, Inc.

The primary focus of the coordination meeting was to obtain information from the Planning Commission regarding the history of land use development within the Study Area for the I-65 to US 31W Connector project. Tonya had used their GIS to develop several maps showing land use changes. These maps showed property platted; property annexed into Bowling Green; and property rezoned. The maps covered an area approximately one mile around the Transpark development.

David indicated that this information was exactly what was needed to complete the cumulative and indirect analysis for this project. He asked if the information could be expanded to cover the entire Study Area for the project. Tonya said this could be provided by the middle of February.

The meeting adjourned at approximately 10:30 AM CST

End of Minutes

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